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## SEQUENCE LISTING

<110> The Walter and Eliza Hall Institute of Medical Research

<120> Pancreatic islet cell growth factors

<130> 2379014/EJH

<150> US 60/183573

<151> 2000-02-18

<160> 30

<170> PatentIn version 3.0

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<212> DNA

<213> mouse

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 Leu Cys Gln Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro  
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gag acc ggg aag aaa aaa gtc gcc gag att cag ggc cac gcg gga gga 144  
Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly  
35 40 45

- 2 -

cgc cgc tca ggg cag agc cat gag ctc ctg cgg gac ttc gag gcg aca 192  
 Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr  
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ctt cta cag atg ttt ggg ctg cgc cgc cgt ccg cag cct agc aag agc 240  
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 65 70 75 80

gcc gtc att ccg gat tac atg agg gat ctt tac cgg ctc cag tct ggg 288  
 Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly  
 85 90 95

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 Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg  
 130 135 140

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 Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser  
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gaa cag ggc ttc cac cgt ata aac att yat gag gtt atg aag ccc cca 576  
 Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro  
 180 185 190

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Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala	
225	230 235 240
att gag gtg act cac ctc cac cag aca cgg acc cac cag ggc cag cat	768
Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His	
245	250 255
gtc aga atc agc cga tcg tta cct caa ggg agt gga gat tgg gcc caa	816
Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln	
260	265 270
ctc cgg ccc ctc ctg gtc act ttt ggc cat gat ggc cgg ggc cat acc	864
Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr	
275	280 285
ttg acc cgc agg agg gcc aaa cgt agt ccc aag acg cgc cag gag gag	912
Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys Thr Arg Gln Glu Glu	
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Glu Tyr Met Pro Met Glu Thr Arg Arg Lys Lys Asn Lys Asn Cys Arg	
305	310 315 320
cgc cat tca cta tac gtg gac ttc agt gac gtg ggc tgg aat gat tgg	1008
Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn Asp Trp	
325	330 335
att gtg gcc cca ccc ggc tac cag gcc ttc tac tgc cat ggg gac tgt	1056
Ile Val Ala Pro Pro Gly Tyr Gln Ala Phe Tyr Cys His Gly Asp Cys	
340	345 350

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 Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Tyr  
 385 390 395 400

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 Gly Cys Arg

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Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly  
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Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr  
 50 55 60

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Leu Leu Gln Met Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser  
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Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly  
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Glu Arg Pro Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu  
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Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg  
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Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser  
145 150 155 160

Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp  
165 170 175

Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro  
180 185 190

Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg  
195 200 205

Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro  
210 215 220

Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala  
225 230 235 240

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Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln

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tta tgc caa gtc ctg cta gga ggc gcg agc cat gct agt ttg ata cct 96  
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gag acc ggg aag aaa aaa gtc gcc gag att cag ggc cac gcg gga gga 144  
Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly  
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65 70 75 80

gcc gtc att ccg gat tac atg agg gat ctt tac cgg ctc cag tct ggg 288  
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115 120 125

gaa cat ctg gag aac atc cca ggg acc agt gag agc tct gct ttt cgt 432

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Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg	
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Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser	
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Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp	
	165 170 175
gaa cag ggc ttc cac cgt ata aac att yat gag gtt atg aag ccc cca	576
Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro	
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gca gaa atg gtt cct gga cac ctc atc aca cga cta ctg gac acc aga	624
Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg	
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cta gtc cat cac aat gtg aca cgg tgg gaa act ttc gat gtg agc cct	672
Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro	
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gca gtc ctt cgc tgg acc cgg gaa aag caa ccc aat tat ggg ctg gcc	720
Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala	
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att gag gtg act cac ctc cac cag aca cgg acc cac cag ggc cag cat	768
Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His	
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Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln	
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ctc cgg ccc ctc ctg gtc act ttt ggc cat gat ggc cgg ggc cat acc	864
Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr	
	275 280 285

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ttg acc cgc agg agg gcc aaa cgt agt ccc aag acg cgc cag gag gag 912  
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 Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp  
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Ala Cys Gly Cys His

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1 5 10 15

Leu Cys Gln Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro

20 25 30

Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly

35 40 45

Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr

50 55 60

Leu Leu Gln Met Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser

65 70 75 80

Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly

85 90 95

Glu Glu Glu Glu Glu Glu Gln Ser Gln Gly Thr Gly Leu Glu Tyr Pro

100 105 110

Glu Arg Pro Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu

115 120 125

Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg

130 135 140

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Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser  
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Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp  
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Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro  
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Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg  
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Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro  
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Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala  
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Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His  
245 250 255

Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln  
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Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr  
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Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys Thr Arg Gln Glu Glu  
290 295 300

Glu Tyr Met Pro Met Glu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg  
305 310 315 320

Gly Ser Gly Ser Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys  
325 330 335

Lys Lys His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp  
340 345 350

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Trp Ile Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu  
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Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile  
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Val Gln Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro  
 385 390 395 400

Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp  
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Ala Cys Gly Cys His  
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 Met Ala Arg Leu Met Ile Pro Gly Asn Arg Met Leu Met Val Val Leu  
 1 5 10 15

tta tgc caa gtc ctg cta gga ggc gcg agc cat gct agt ttg ata cct 96  
 Leu Cys Gln Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro  
 20 25 30

gag acc ggg aag aaa aaa gtc gcc gag att cag ggc cac gcg gga gga 144

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- 13 -

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Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly	
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Glu Glu Glu Glu Glu Glu Gln Ser Gln Gly Thr Gly Leu Glu Tyr Pro	
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Glu Arg Pro Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu	
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Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser	
145 150 155 160	
gca gag ctc cgg ctc ttt cgg gag cag gtg gac cag ggc cct gac tgg	528
Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp	
165 170 175	
gaa cag ggc ttc cac cgt ata aac att yat gag gtt atg aag ccc cca	576
Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro	
180 185 190	

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gca gaa atg gtt cct gga cac ctc atc aca cga cta ctg gac acc aga	624
Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg	
195 200 205	
cta gtc cat cac aat gtg aca cgg tgg gaa act ttc gat gtg agc cct	672
Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro	
210 215 220	
gca gtc ctt cgc tgg acc cgg gaa aag caa ccc aat tat ggg ctg gcc	720
Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala	
225 230 235 240	
att gag gtg act cac ctc cac cag aca cgg acc cac cag ggc cag cat	768
Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His	
245 250 255	
gtc aga atc agc cga tcg tta cct caa ggg agt gga gat tgg gcc caa	816
Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln	
260 265 270	
ctc cgg ccc ctc ctg gtc act ttt ggc cat gat ggc cgg ggc cat acc	864
Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr	
275 280 285	
ttg acc cgc agg agg gcc aaa cgt agt ccc aag cat cac cca cag cgg	912
Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys His His Pro Gln Arg	
290 295 300	
tcc acg cgc cag gag cag aag ctt atc tcg gag gag gac ctg acg cgt	960
Ser Thr Arg Gln Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Thr Arg	
305 310 315 320	
agg aag aag aat aag aac tgc cgt cgc cat tca cta tac gtg gac ttc	1008
Arg Lys Lys Asn Lys Asn Cys Arg Arg His Ser Leu Tyr Val Asp Phe	
325 330 335	
agt gac gtg ggc tgg aat gat tgg att gtg gcc cca ccc ggc tac cag	1056

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Ser Asp Val Gly Trp Asn Asp Trp Ile Val Ala Pro Pro Gly Tyr Gln  
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 Ala Phe Tyr Cys His Gly Asp Cys Pro Phe Pro Leu Ala Asp His Leu  
 355 360 365

aac tca acc aac cat gcc att gtg cag acc cta gtc aac tct gtt aat 1152  
 Asn Ser Thr Asn His Ala Ile Val Gln Thr Leu Val Asn Ser Val Asn  
 370 375 380

tct agt atc cct aag gcc tgt tgt gtc ccc act gaa ctg agt gcc att 1200  
 Ser Ser Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile  
 385 390 395 400

tcc atg ttg tac ctg gat gag tat gac aag gtg gtg ttg aaa aat tat 1248  
 Ser Met Leu Tyr Leu Asp Glu Tyr Asp Lys Val Val Leu Lys Asn Tyr  
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Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly  
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Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr  
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Leu Leu Gln Met Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser  
65 70 75 80

Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly  
85 90 95

Glu Glu Glu Glu Glu Glu Gln Ser Gln Gly Thr Gly Leu Glu Tyr Pro  
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Glu Arg Pro Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu  
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Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg  
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Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser  
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Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp  
165 170 175

Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro  
180 185 190

Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg  
195 200 205

Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro  
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Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala  
225 230 235 240

Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His  
245 250 255



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Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln  
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Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr  
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Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys His His Pro Gln Arg  
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Ser Thr Arg Gln Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Thr Arg  
305 310 315 320

Arg Lys Lys Asn Lys Asn Cys Arg Arg His Ser Leu Tyr Val Asp Phe  
325 330 335

Ser Asp Val Gly Trp Asn Asp Trp Ile Val Ala Pro Pro Gly Tyr Gln  
340 345 350

Ala Phe Tyr Cys His Gly Asp Cys Pro Phe Pro Leu Ala Asp His Leu  
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Asn Ser Thr Asn His Ala Ile Val Gln Thr Leu Val Asn Ser Val Asn  
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Ser Ser Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile  
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Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
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85 90 95

ccg gac gga cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc 336  
Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
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cag ggc ccc cct tta gcc agc ctg cag gac agc cac ttc ctc act gac 384  
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115 120 125

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Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu	
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Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser	
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Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr	
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Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr	
180 185 190	
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Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe	
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Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val	
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Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His	
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Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile	
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Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys	
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caa ccc ttc atg gtg gcc ttc ttc aag gcc acg gaa gtc cat ctc cgt	864

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Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg	
275	280 285
agt atc cgg tcc acg ggg ggc acg cgc cag gag gag gaa tac atg ccc	912
Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Glu Glu Tyr Met Pro	
290	295 300
atg gag acg cgt acc cag tcg cag gac gtg tcc cgg ggc tcc ggt tct	960
Met Glu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg Gly Ser Gly Ser	
305	310 315 320
tca gac tac aac ggc agt gag tta aaa aca gct tgc aag aag cat gag	1008
Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys Lys Lys His Glu	
325	330 335
ctc tat gtg agc ttc cag gac ctg gga tgg cag gac tgg atc att gca	1056
Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala	
340	345 350
ccc aaa ggc tac gct gcc aac tac tgt gat gga gag tgt tcc ttc cca	1104
Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu Cys Ser Phe Pro	
355	360 365
ctc aac gca cac atg aat gcc acc aac cac gcc att gta cag acc ttg	1152
Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu	
370	375 380
gtc cac ctt atg aat ccc gag tac gtc ccc aaa cca tgc tgc gca cca	1200
Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro Cys Cys Ala Pro	
385	390 395 400
acc aaa ctg aat gcc atc tcg gtt ctt tac ttc gat gat aac tcc aat	1248
Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn Ser Asn	
405	410 415
gtc atc ttg aaa aag tac agg aat atg gtc gtg aga gct tgt ggt tgc	1296
Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys	
420	425 430

- 21 -

cat taagttgaag ctggtgtgtg tgtgtgggtg ggggcatggt tctgccttgg a 1350  
His

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Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala  
1 5 10 15

Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
20 25 30

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
35 40 45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
50 55 60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
65 70 75 80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly  
85 90 95

Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
100 105 110

Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp  
115 120 125

Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu  
130 135 140

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- 22 -

Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser  
 145 150 155 160

Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr  
 165 170 175

Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr  
 180 185 190

Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe  
 195 200 205

Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val  
 210 215 220

Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His  
 225 230 235 240

Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile  
 245 250 255

Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys  
 260 265 270

Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg  
 275 280 285

Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Glu Glu Tyr Met Pro  
 290 295 300

Met Glu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg Gly Ser Gly Ser  
 305 310 315 320

Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys Lys Lys His Glu  
 325 330 335

Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala  
 340 345 350

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Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu Cys Ser Phe Pro  
 355 360 365

Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu  
 370 375 380

Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro Cys Cys Ala Pro  
 385 390 395 400

Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn Ser Asn  
 405 410 415

Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys  
 420 425 430

His

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atg cac gtg cgc tcg ctg cgc gct gcg gcg cca cac agc ttc gtg gcg 48  
 Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala  
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ctc tgg gcg cct ctg ttc ttg ctg cgc tcc gcc ctg gcc gat ttc agc 96  
 Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
 20 25 30

ctg gac aac gag gtg cac tcc agc ttc atc cac cgg cgc ctc cgc agc 144

- 24 -

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
 35 40 45  
 cag gag cgg cgg gag atg cag cgg gag atc ctg tcc atc tta ggg ttg 192  
 Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
 50 55 60  
 ccc cat cgc ccg cgc ccg cac ctc cag gga aag cat aat tcg gcg ccc 240  
 Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
 65 70 75 80  
 atg ttc atg ttg gac ctg tac aac gcc atg gcg gtg gag gag agc ggg 288  
 Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly  
 85 90 95  
 ccg gac gga cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc 336  
 Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
 100 105 110  
 cag ggc ccc cct tta gcc agc ctg cag gac agc cac ttc ctc act gac 384  
 Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp  
 115 120 125  
 gcc gac atg gtc atg agc ttc gtc aac cta gtg gaa cat gac aaa gaa 432  
 Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu  
 130 135 140  
 ttc ttc cac cct cga tac cac cat cgg gag ttc cgg ttt gat ctt tcc 480  
 Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser  
 145 150 155 160  
 aag atc ccc gag ggc gaa cgg gtg acc gca gcc gaa ttc agg atc tat 528  
 Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr  
 165 170 175  
 aag gac tac atc cgg gag cga ttt gac aac gag acc ttc cag atc aca 576  
 Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr  
 180 185 190

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gtc tat cag gtg ctc cag gag cac tca ggc agg gag tcg gac ctc ttc 624  
 Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe  
 195 200 205

ttg ctg gac agc cgc acc atc tgg gct tct gag gag ggc tgg ttg gtg 672  
 Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val  
 210 215 220

ttt gat atc aca gcc acc agc aac cac tgg gtg gtc aac cct cgg cac 720  
 Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His  
 225 230 235 240

aac ctg ggc tta cag ctc tct gtg gag acc ctg gat ggg cag agc atc 768  
 Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile  
 245 250 255

aac ccc aag ttg gca ggc ctg att gga cgg cat gga ccc cag aac aag 816  
 Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys  
 260 265 270

caa ccc ttc atg gtg gcc ttc ttc aag gcc acg gaa gtc cat ctc cgt 864  
 Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg  
 275 280 285

agt atc cgg tcc acg ggg ggc acg cgc cag gag cag aag ctt atc tcg 912  
 Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Gln Lys Leu Ile Ser  
 290 295 300

gag gag gac ctg acg cgt acc cag tcg cag gac gtg tcc cgg ggc tcc 960  
 Glu Glu Asp Leu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg Gly Ser  
 305 310 315 320

ggt tct tca gac tac aac ggc agt gag tta aaa aca gct tgc aag aag 1008  
 Gly Ser Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys Lys Lys  
 325 330 335

cat gag ctc tat gtg agc ttc cag gac ctg gga tgg cag gac tgg atc 1056

- 26 -

His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp Trp Ile

340

345

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att gca ccc aaa ggc tac gct gcc aac tac tgt gat gga gag tgt tcc 1104

Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu Cys Ser

355

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ttc cca ctc aac gca cac atg aat gcc acc aac cac gcc att gta cag 1152

Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile Val Gln

370

375

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acc ttg gtc cac ctt atg aat ccc gag tac gtc ccc aaa cca tgc tgc 1200

Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro Cys Cys

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395

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gca cca acc aaa ctg aat gcc atc tcg gtt ctt tac ttc gat gat aac 1248

Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn

405

410

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tcc aat gtc atc ttg aaa aag tac agg aat atg gtc gtg aga gct tgt 1296

Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys

420

425

430

ggc tgc cat gtt gaa gct ggt gtg tgt gtg tgg gtg ggg gca tgg ttc 1344

Gly Cys His Val Glu Ala Gly Val Cys Val Trp Val Gly Ala Trp Phe

435

440

445

tgc ctt gga

1353

Cys Leu Gly

450

&lt;210&gt; 10

&lt;211&gt; 451

&lt;212&gt; PRT

&lt;213&gt; mouse

&lt;400&gt; 10

Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala

- 27 -

1 5 10 15  
Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
20 25 30  
Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
35 40 45  
Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
50 55 60  
Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
65 70 75 80  
Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly  
85 90 95  
Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
100 105 110  
Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp  
115 120 125  
Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu  
130 135 140  
Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser  
145 150 155 160  
Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr  
165 170 175  
Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr  
180 185 190  
Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe  
195 200 205

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Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val  
 210 215 220

Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His  
 225 230 235 240

Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile  
 245 250 255

Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys  
 260 265 270

Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg  
 275 280 285

Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Gln Lys Leu Ile Ser  
 290 295 300

Glu Glu Asp Leu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg Gly Ser  
 305 310 315 320

Gly Ser Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys Lys Lys  
 325 330 335

His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp Trp Ile  
 340 345 350

Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu Cys Ser  
 355 360 365

Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile Val Gln  
 370 375 380

Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro Cys Cys  
 385 390 395 400

Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn  
 405 410 415

- 29 -

Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys  
 420 425 430

Gly Cys His Val Glu Ala Gly Val Cys Val Trp Val Gly Ala Trp Phe  
 435 440 445

Cys Leu Gly  
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 Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala  
 1 5 10 15

ctc tgg gcg cct ctg ttc ttg ctg cgc tcc gcc ctg gcc gat ttc agc 96  
 Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
 20 25 30

ctg gac aac gag gtg cac tcc agc ttc atc cac cgg cgc ctc cgc agc 144  
 Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
 35 40 45

cag gag cgg cgg gag atg cag cgg gag atc ctg tcc atc tta ggg ttg 192  
 Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
 50 55 60

ccc cat cgc ccg cgc ccg cac ctc cag gga aag cat aat tcg gcg ccc 240  
 Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro

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65	70	75	80	
atg ttc atg ttg gac ctg tac aac gcc atg gcg gtg gag gag agc ggg				288
Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly				
	85	90	95	
ccg gac gga cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc				336
Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr				
	100	105	110	
cag ggc ccc cct tta gcc agc ctg cag gac agc cac ttc ctc act gac				384
Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp				
	115	120	125	
gcc gac atg gtc atg agc ttc gtc aac cta gtg gaa cat gac aaa gaa				432
Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu				
	130	135	140	
ttc ttc cac cct cga tac cac cat cgg gag ttc cgg ttt gat ctt tcc				480
Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser				
	145	150	155	160
aag atc ccc gag ggc gaa cgg gtg acc gca gcc gaa ttc agg atc tat				528
Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr				
	165	170	175	
aag gac tac atc cgg gag cga ttt gac aac gag acc ttc cag atc aca				576
Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr				
	180	185	190	
gtc tat cag gtg ctc cag gag cac tca ggc agg gag tcg gac ctc ttc				624
Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe				
	195	200	205	
ttg ctg gac agc cgc acc atc tgg gct tct gag gag ggc tgg ttg gtg				672
Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val				
	210	215	220	

t t t	g a t	a t c	a c a	g c c	a c c	a g c	a a c	c a c	t g g	g t g	g t c	a a c	c c t	c g g	c a c	720
P h e	A s p	I l e	T h r	A l a	T h r	S e r	A s n	H i s	T r p	V a l	V a l	A s n	P r o	A r g	H i s	
225					230					235					240	
a a c	c t g	g g c	t t a	c a g	c t c	t c t	g t g	g a g	a c c	c t g	g a t	g g g	c a g	a g c	a t c	768
A s n	L e u	G l y	L e u	G l n	L e u	S e r	V a l	G l u	T h r	L e u	A s p	G l y	G l n	S e r	I l e	
				245					250					255		
a a c	c c c	a a g	t t g	g c a	g g c	c t g	a t t	g g a	c g g	c a t	g g a	c c c	c a g	a a c	a a g	816
A s n	P r o	L y s	L e u	A l a	G l y	L e u	I l e	G l y	A r g	H i s	G l y	P r o	G l n	A s n	L y s	
			260					265					270			
c a a	c c c	t t c	a t g	g t g	g c c	t t c	t t c	a a g	g c c	a c g	g a a	g t c	c a t	c t c	c g t	864
G l n	P r o	P h e	M e t	V a l	A l a	P h e	P h e	L y s	A l a	T h r	G l u	V a l	H i s	L e u	A r g	
		275						280					285			
a g t	a t c	c g g	t c c	a c g	g g g	g g c	a c g	c g c	c a g	g a g	g a g	g a a	t a c	a t g	c c c	912
S e r	I l e	A r g	S e r	T h r	G l y	G l y	T h r	A r g	G l n	G l u	G l u	G l u	T y r	M e t	P r o	
	290						295					300				
a t g	g a g	a c g	c g t	c c a	a a g	a a c	c a a	g a g	g c c	c t g	a g g	a t g	g c c	a g t	g t g	960
M e t	G l u	T h r	A r g	P r o	L y s	A s n	G l n	G l u	A l a	L e u	A r g	M e t	A l a	S e r	V a l	
305					310					315					320	
g c a	g a a	a a c	a g c	a g c	a g t	g a c	c a g	a g g	c a g	g c c	t g c	a a g	a a a	c a t	g a g	1008
A l a	G l u	A s n	S e r	S e r	S e r	A s p	G l n	A r g	G l n	A l a	C y s	L y s	L y s	H i s	G l u	
				325					330					335		
c t g	t a c	g t c	a g c	t t c	c g a	g a c	c t t	g g c	t g g	c a g	g a c	t g g	a t c	a t t	g c a	1056
L e u	T y r	V a l	S e r	P h e	A r g	A s p	L e u	G l y	T r p	G l n	A s p	T r p	I l e	I l e	A l a	
			340					345					350			
c c t	g a a	g g c	t a t	g c t	g c c	t a c	t a c	t g t	g a g	g g a	g a g	t g c	g c c	t t c	c c t	1104
P r o	G l u	G l y	T y r	A l a	A l a	T y r	T y r	C y s	G l u	G l y	G l u	C y s	A l a	P h e	P r o	
		355					360					365				
c t g	a a c	t c c	t a c	a t g	a a c	g c c	a c c	a a c	c a c	g c c	a t c	g t c	c a g	a c a	c t g	1152
L e u	A s n	S e r	T y r	M e t	A s n	A l a	T h r	A s n	H i s	A l a	I l e	V a l	G l n	T h r	L e u	

370

375

380

ggt cac ttc atc aac cca gac aca gta ccc aag ccc tgc tgt gcg ccc 1200  
Val His Phe Ile Asn Pro Asp Thr Val Pro Lys Pro Cys Cys Ala Pro  
385 390 395 400

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Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn  
405 410 415

gtc atc ctg aag aag tac aga aac atg gtg gtc cgg gcc tgt ggc tgc 1296  
Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys  
420 425 430

cac tagctcttcc tgagaccctg acctttgcgg ggccacacct ttccaaa 1346  
His

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Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
35 40 45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
50 55 60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
65                      70                      75                      80

[illegible]



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Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly  
85 90 95

Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
100 105 110

Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp  
115 120 125

Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu  
130 135 140

Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser  
145 150 155 160

Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr  
165 170 175

Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr  
180 185 190

Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe  
195 200 205

Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val  
210 215 220

Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His  
225 230 235 240

Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile  
245 250 255

Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys  
260 265 270

Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg

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275                      280                      285  
 Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Glu Glu Tyr Met Pro  
 290                      295                      300  
 Met Glu Thr Arg Pro Lys Asn Gln Glu Ala Leu Arg Met Ala Ser Val  
 305                      310                      315                      320  
 Ala Glu Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu  
 325                      330                      335  
 Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala  
 340                      345                      350  
 Pro Glu Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro  
 355                      360                      365  
 Leu Asn Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu  
 370                      375                      380  
 Val His Phe Ile Asn Pro Asp Thr Val Pro Lys Pro Cys Cys Ala Pro  
 385                      390                      395                      400  
 Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn  
 405                      410                      415  
 Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys  
 420                      425                      430  
 His

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- 35 -

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&lt;222&gt; (1)..(1305)

&lt;400&gt; 13

atg cac gtg cgc tcg ctg cgc gct gcg gcg cca cac agc ttc gtg gcg 48

Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala

1 5 10 15

ctc tgg gcg cct ctg ttc ttg ctg cgc tcc gcc ctg gcc gat ttc agc 96

Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser

20 25 30

ctg gac aac gag gtg cac tcc agc ttc atc cac cgg cgc ctc cgc agc 144

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser

35 40 45

cag gag cgg cgg gag atg cag cgg gag atc ctg tcc atc tta ggg ttg 192

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu

50 55 60

ccc cat cgc ccg cgc ccg cac ctc cag gga aag cat aat tcg gcg ccc 240

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro

65 70 75 80

atg ttc atg ttg gac ctg tac aac gcc atg gcg gtg gag gag agc ggg 288

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly

85 90 95

ccg gac gga cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc 336

Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr

100 105 110

cag ggc ccc cct tta gcc agc ctg cag gac agc cac ttc ctc act gac 384

Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp

115 120 125

gcc gac atg gtc atg agc ttc gtc aac cta gtg gaa cat gac aaa gaa 432

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Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu	
130 135 140	
ttc ttc cac cct cga tac cac cat cgg gag ttc cgg ttt gat ctt tcc	480
Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser	
145 150 155 160	
aag atc ccc gag ggc gaa cgg gtg acc gca gcc gaa ttc agg atc tat	528
Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr	
165 170 175	
aag gac tac atc cgg gag cga ttt gac aac gag acc ttc cag atc aca	576
Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr	
180 185 190	
gtc tat cag gtg ctc cag gag cac tca ggc agg gag tcg gac ctc ttc	624
Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe	
195 200 205	
ttg ctg gac agc cgc acc atc tgg gct tct gag gag ggc tgg ttg gtg	672
Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val	
210 215 220	
ttt gat atc aca gcc acc agc aac cac tgg gtg gtc aac cct cgg cac	720
Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His	
225 230 235 240	
aac ctg ggc tta cag ctc tct gtg gag acc ctg gat ggg cag agc atc	768
Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile	
245 250 255	
aac ccc aag ttg gca ggc ctg att gga cgg cat gga ccc cag aac aag	816
Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys	
260 265 270	
caa ccc ttc atg gtg gcc ttc ttc aag gcc acg gaa gtc cat ctc cgt	864
Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg	
275 280 285	

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agt atc cgg tcc acg ggg ggc acg cgc cag gag cag aag ctt atc tcg 912  
 Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Gln Lys Leu Ile Ser  
 290 295 300

gag gag gac ctg acg cgt cca aag aac caa gag gcc ctg agg atg gcc 960  
 Glu Glu Asp Leu Thr Arg Pro Lys Asn Gln Glu Ala Leu Arg Met Ala  
 305 310 315 320

agt gtg gca gaa aac agc agc agt gac cag agg cag gcc tgc aag aaa 1008  
 Ser Val Ala Glu Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys  
 325 330 335

cat gag ctg tac gtc agc ttc cga gac ctt ggc tgg cag gac tgg atc 1056  
 His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile  
 340 345 350

att gca cct gaa ggc tat gct gcc tac tac tgt gag gga gag tgc gcc 1104  
 Ile Ala Pro Glu Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala  
 355 360 365

ttc cct ctg aac tcc tac atg aac gcc acc aac cac gcc atc gtc cag 1152  
 Phe Pro Leu Asn Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln  
 370 375 380

aca ctg gtt cac ttc atc aac cca gac aca gta ccc aag ccc tgc tgt 1200  
 Thr Leu Val His Phe Ile Asn Pro Asp Thr Val Pro Lys Pro Cys Cys  
 385 390 395 400

gcg ccc acc cag ctc aac gcc atc tct gtc ctc tac ttc gac gac agc 1248  
 Ala Pro Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser  
 405 410 415

tct aat gtc atc ctg aag aag tac aga aac atg gtg gtc cgg gcc tgt 1296  
 Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys  
 420 425 430

ggc tgc cac tagctcttcc tgagaccctg acctttgcgg ggccacacct ttccaaa 1352

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Gly Cys His

435

&lt;210&gt; 14

&lt;211&gt; 435

&lt;212&gt; PRT

&lt;213&gt; mouse

&lt;400&gt; 14

Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala

1

5

10

15

Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser

20

25

30

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser

35

40

45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu

50

55

60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro

65

70

75

80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly

85

90

95

Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr

100

105

110

Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp

115

120

125

Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu

130

135

140

Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser

145

150

155

160

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Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr  
165 170 175

Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr  
180 185 190

Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe  
195 200 205

Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val  
210 215 220

Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His  
225 230 235 240

Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile  
245 250 255

Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys  
260 265 270

Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg  
275 280 285

Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Gln Lys Leu Ile Ser  
290 295 300

Glu Glu Asp Leu Thr Arg Pro Lys Asn Gln Glu Ala Leu Arg Met Ala  
305 310 315 320

Ser Val Ala Glu Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys  
325 330 335

His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile  
340 345 350

Ile Ala Pro Glu Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala

- 40 -

355

360

365

Phe Pro Leu Asn Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln

370

375

380

Thr Leu Val His Phe Ile Asn Pro Asp Thr Val Pro Lys Pro Cys Cys

385

390

395

400

Ala Pro Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser

405

410

415

Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys

420

425

430

Gly Cys His

435

&lt;210&gt; 15

&lt;211&gt; 25

&lt;212&gt; DNA

&lt;213&gt; primer

&lt;400&gt; 15

gtggaggaac ttccagagat gagtg

25

&lt;210&gt; 16

&lt;211&gt; 26

&lt;212&gt; DNA

&lt;213&gt; primer

&lt;400&gt; 16

atttattcctt gctgtgctaa cgacac

26

&lt;210&gt; 17

&lt;211&gt; 26

&lt;212&gt; DNA

&lt;213&gt; primer



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24